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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/705,486

11/10/2003

David Punsalan

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22879

7590

09/12/2008

HEWLETT PACKARD COMPANY  
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INTELLECTUAL PROPERTY ADMINISTRATION  
FORT COLLINS, CO 80527-2400

EXAMINER

WILKINS III, HARRY D

ART UNIT

PAPER NUMBER

1795

NOTIFICATION DATE

DELIVERY MODE

09/12/2008

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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<b>Office Action Summary</b>	<b>Application No.</b> 10/705,486	<b>Applicant(s)</b> PUNSALAN ET AL.	
	<b>Examiner</b> Harry D. Wilkins, III	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 July 2008.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,3-18 and 53-73 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 17 and 64-72 is/are allowed.
- 6) ☒ Claim(s) 1,3-12,53-61 and 73 is/are rejected.
- 7) ☒ Claim(s) 13-16,18,62 and 63 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Status***

1. An appeal conference was conducted on 3 September 2008. During the discussion, agreement was reached with respect to the anticipation rejection of claims 57 and 58, all be it with a bit of rewording required, such that if it had been the only rejection ground present, the application would have been ready for appeal. Upon discussion of the references and the grounds of obviousness set forth in the final rejection mailed 31 March 2008, it was determined that the rejection under 35 USC 103 was not entirely clear and/or proper. However, an alternate obviousness rejection was proposed, which is set forth below.

### ***Claim Scope Interpretation***

2. Applicant has argued the scope of the claim term “electrodepositing” to mean an a method involving an electrolytic reaction. However, no express definition was set forth in the specification as filed for the term “electrodepositing”. Thus, it is treated for purposes of examination as a method involving deposition of material utilizing electricity, not necessarily also involving an electrolytic chemical reaction. Further, see the newly cited NPL article “Application of electrophoretic and electrolytic deposition techniques in ceramics processing”, which discusses the use of electrodeposition, which is essentially a genus, with electrophoretic and electrolytic deposition techniques being species within the genus.

3. Of note is claim 18 that further limits the term “electrodepositing” by stating that the electrodepositing comprises “electrolytic deposition”. If “electrodepositing” meant “electrolytic deposition” then that feature of claim 18 would not have been necessary.

4. Further, Applicant's arguments at pages 10-11 regarding electropolymerization does not deposit material to the target location are noted, but are not agreed to by the examiner. Electropolymerization involved taking material that was in solution and forming a layer of that material on a target location. The target location did not originally include the polymer layer. Therefore, it is a process of deposition.

5. However, in view of the new rejection grounds presented below, it appears that Applicant's contention regarding the electropolymerization process of Honda et al is moot due to the teachings of Furuya and Yoshida.

***Claim Rejections - 35 USC § 102***

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6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 57 and 58 are rejected under 35 U.S.C. 102(a) or (e) as being anticipated by Furuya (US 2003/0134177).

Furuya anticipate the invention as claimed. Furuya teaches (see figure 1, abstract and paragraphs 55 and 110-115) the electrophoretic deposition of an fuel cell electrolyte film made of fluororesin particles (i.e.-a solution already comprising polymer units).

Regarding claim 58, Furuya suggests forming films of Nafion<sup>®</sup> (perfluorosulfonate polymer) and using particles of the resin.

### ***Claim Rejections - 35 USC § 103***

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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9. Claims 1, 3-10, 12, 53-60 and 73 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furuya (US 2003/0134177) in view of Murphy et al (US 6,059,943) and Honda et al (US 5,281,327) with evidence from Yoshida (US 2003/0071259).

Furuya teaches (see figure 1, abstract and paragraphs 55 and 110-115) the electrodeposition (by electrophoresis) of an electrolyte material to form an electrolyte film on a substrate.

Murphy et al teach (see abstract, figure 12, col. 8, lines 35-44 and the paragraph spanning cols. 8 and 9) composite polymer (including perfluorosulphonic acid (i.e.- Nafion<sup>®</sup>))-metal oxide (i.e.-structural material) membranes that are quite suitable for use as membranes for fuel cells, and reduced the dependence on water of the membrane.

Therefore, it would have been obvious to one of ordinary skill in the art to have altered the production method of Furuya to produce the electrolyte composite film of Murphy et al.

It was known in the art of electrophoretic deposition that many materials were suitable for deposition by electrophoresis including both fine particles of resins (polymers) and also ceramic fine particles, and that they could be used in combination (i.e.-co-deposited at the same time) without causing any problem. See Yoshida at paragraph 346.

Thus, one of ordinary skill in the art would have had a reasonable expectation of successfully codepositing the polymeric particles of both Furuya and Murphy et al with the ceramic (metal oxide) particles of Murphy et al by electrophoresis to form the electrolyte composite film of Murphy et al.

Furuya and Murphy et al fail to teach use of a perimeter support in the electrodeposition cell.

Honda et al teach (see abstract, drawings and cols. 1-2) a method of electrodepositing a material onto a substrate including the steps of 1) removably coupling a perimeter support (2, 2') to a temporary substrate (3) and 2) electrodepositing a polymeric material film (6) on to the temporary substrate. The formed film is supported at its perimeter by the perimeter support.

Therefore, it would have been obvious to one of ordinary skill in the art to have utilized the perimeter supported electrodeposition cell design of Honda et al in place of the electrodeposition cell design of Furuya because the design of Honda et al permitted using limited volumes of liquid while achieving deposition onto only the desired portions of the substrate.

Additionally, it is noted that although Applicant's disclosure describes the formed membrane becoming attached during formation to the perimeter support, this feature is not required by these claims.

Regarding claim 5, the perimeter support of Honda et al was a gasket.

Regarding claim 6, the temporary substrate of both Furuya and Honda et al was an electrode.

Regarding claim 7, Furuya teaches (see paragraphs 126 and 127) that the composition can be altered such that the electrolyte was deposited on either anode or cathode.

Regarding claims 8-10, Furuya teaches (see paragraphs 110-116) and Honda et al teach (see col. 5, lines 37-47) using metallic material as the temporary substrate, particularly stainless steel. Stainless steel inherently includes at least some nickel due to standard manufacturing processes.

Regarding claim 53, Furuya in view of Murphy et al with evidence of Yoshida suggests the simultaneous deposition of the polymer particles and ceramic particles.

Regarding claim 54, the electrolyte film of Murphy et al conducts ions when moisture is present.

Regarding claim 55, Murphy et al suggest (see Example 2) forming an anode and cathode on opposing sides of the electrolyte membrane to form a fuel cell.

Regarding claim 56, Furuya suggests contacting the temporary substrate with a solution already containing the polymer units and attracting the polymer units to the substrate using an electric field.

Regarding claim 57, as discussed above, the materials utilized by Furuya and Murphy et al included materials suitable for use as electrolytes in fuel cells.

Regarding claim 58, Furuya suggests (see paragraph 37) using Nafion<sup>®</sup> particles to form the polymer membrane.

Regarding claim 59, Murphy et al suggests adding ceramic particles to the solution to form an electrolyte composite film. Yoshida et al shows the reasonable expectation that the ceramic particles would migrate under the electrical field similarly to the polymer particles.



Regarding claim 60, as above, Honda et al discloses disposing a perimeter support on the temporary substrate as claimed to use limited volumes of liquid while achieving deposition onto only the desired portions of the substrate

Regarding claim 61, although Honda et al are silent with respect to using a release material, since the film was to be separated from the temporary substrate, it would have been obvious to one of ordinary skill in the art to have provided a material that made the separation easier.

Regarding claim 73, Honda et al discloses depositing the material onto the temporary substrate adjacent the perimeter support. The perimeter support bounds the deposited film, such that the support and the film are “coupled” to each other. Applicant has failed to define that the “coupling” of claim 73 requires permanent attachment between the perimeter support and the temporary substrate.

10. Claims 11 and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Furuya (US 2003/0134177) in view of Murphy et al (US 6,059,943) and Honda et al (US 5,281,327) with evidence from Yoshida (US 2003/0071259) as applied to claims 1 and 57 above, and further in view of Facci et al (US 5,079,121).

Furuya discloses (see description at paragraphs 111-122) that electrodeposited layers are joined to a temporary substrate (stainless steel foil) and that at a later time the layers are removed from the temporary substrate.

Facci et al teach (see abstract and col. 8, lines 40-56) that it was known in the art of electrodeposition that when the deposited material was to be removed from a

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temporary substrate, use of a release agent was occasionally helpful to enhance the removal of the temporary substrate.

Therefore, it would have been obvious to one of ordinary skill in the art to have utilized a release agent on the temporary substrate (stainless steel) of Furuya as taught by Facci et al for the purpose of enhancing the removal of the temporary substrate from the formed layers.

***Allowable Subject Matter***

11. Claims 17 and 64-72 are allowed.

12. The following is a statement of reasons for the indication of allowable subject matter: the prior art does not teach or suggest formation of a polymeric film with use of a perimeter support (gasket) wherein the film becomes attached to the perimeter support such that both are removed from a temporary substrate as an integral unit, such as a membrane assembly.

13. Claims 13-16, 18 and 62-63 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

14. The following is a statement of reasons for the indication of allowable subject matter: the prior art as a whole does not suggest a further deposition step of depositing ions, much less that this further deposition step seals the electrolyte composite film.

***Response to Arguments***

15. Applicant's arguments filed 22 July 2008 have been fully considered but they are not persuasive. Applicant has argued that Furuya does not teach formation of a fuel cell electrolyte.

In response, Applicant's remarks do not take into account the span of paragraphs 110 to 122 of Furuya which clearly discloses making the polymeric fuel cell electrolyte by electrodeposition in addition to the gas diffusion electrode (gas supply layer) and the catalyst layer (reaction layer).

***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Harry D. Wilkins, III whose telephone number is 571-272-1251. The examiner can normally be reached on M-F 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Susy Tsang-Foster can be reached on 571-272-1293. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Harry D Wilkins, III/  
Primary Examiner, Art Unit 1795

hdw